FALL 1974

Our Public Lands

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The approaching Bicentennial year—page 8
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Our Public Lands

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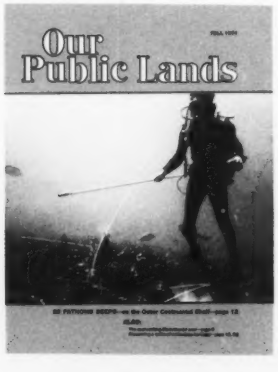

University of West Florida marine biologist Pete Blizzard standing on reef face, a diver in the environmental baseline protection survey in Gulf of Mexico waters. Undersea examination protects area before drilling for oil and gas on Outer Continental Shelf.—Photo by Dr. Thomas Hopkins, University of West Florida

U.S. DEPARTMENT OF THE INTERIOR
Rogers C. B. Morton, Secretary

BUREAU OF LAND MANAGEMENT
Curt Berklund, Director

As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral, land, park, and recreational resources. Indian and Territorial affairs are other major concerns of America's "Department of Natural Resources."

The Department works to assure the wisest choice in managing all our resources so each will make its full contribution to a better United States—now and in the future.

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Jim Robinson, Editor

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States Share More Than $73 Million in Public Land Payments

A record $73 million has been distributed to 23 States that share in funds from Federal lands managed by the Bureau of Land Management. The payment, which is made semiannually, represents about a 150-percent increase over the same period a year ago. Last year's payment to 23 States amounted to $29 million.

The overall increase was, in part, due to the sale of oil shale tracts in Colorado and Utah, but other States also received higher payments because of an increase in mineral leasing activity.

The payment represents the State's share of revenue sales of public lands during the 6-month period that ended June 30, 1974.

With the exception of Alaska, each State having National Resource Lands receives semiannual payments of 37.5 percent of Federal revenues collected within that State from mineral leasing bonuses, rentals, and royalties. Under its Statehood Act, Alaska receives 90 percent of mineral leasing revenues.

Final Accounting Raises BLM Payments to O&C Counties to More Than $57 Million

A final accounting shows that more than 18 western Oregon counties will receive a record total of more than $57.7 million as their share of timber revenues from revested Oregon and California railroad grant lands during fiscal year 1974.

Checks totaling $5.6 million mailed to the counties represent the counties' share from timber revenues collected in the month of June 1974. The counties had received payment based on revenue collections for 11 months in early July.

The July payment of more than $52.1 million was made at the request of county officials so that they could plan their annual budgets before the end of the fiscal year.

The 1974 payment exceeded by more than $10 million the amount paid to the countries in 1973. The record payment reflects rising timber prices.

Federal Agencies Work Out Problems of Offshore Leasing

Working meticulously within a delicate balance of conflicting public attitudes, the need for petroleum energy sources, and the legal requirements to preserve and protect the marine environment, Federal agencies are seeking to determine if frontier areas of the Outer Continental Shelf (OCS) can be opened for oil and gas exploration.

At stake is the prospect of diminishing the Nation's dependence on foreign imports by tapping the underseas treasure of the OCS: known but undiscovered reserves estimated at from 58 billion to 116 billion barrels of crude oil and from 355 trillion to 710 trillion cubic feet of natural gas.

The areas in question are in the Gulf of Mexico where oil and gas have been recovered for some 30 years, the Pacific tidelands off the coast of southern California and perhaps including Oregon and Washington, Arctic waters off the coast of Alaska, and three subsea areas which are located miles seaward of the Atlantic coastline.

OCS exploration is regarded as a stopgap move toward energy independence until environmental protection measures and technology can be developed to permit the use of solar energy, nuclear power, geothermal steam, oil shale, and low sulphur coal. Many of these potential energy resources are located abundantly on Federal lands.

(Continued on Page 7)

Guzzlers May Make The Difference

by Bill Vincent

(*Reprinted by permission from The Nevadan.)

WHEN THE SOUTHWEST thousands of years ago turned from green to gray, the animals and birds which were able to adapt to life in a desert just naturally set up housekeeping around waterholes.

Nature is not a planner, and in going about her merry way there turned out to be big regions where surface water just doesn't exist, not on a reliable year round basis. In these areas, until now, wildlife has been limited to such special little creatures as kangeroo rats, tortoises, and tarantulas which don't even need a drink in a lifetime to thrive.

Recently, State and Federal agencies concerned with wildlife have been giving old Mama Nature a helping hand, going her one better by establishing self-renewing drinking fountains called guzzlers. In the last few years in Clark County (Nevada), one guzzler has been set up for elk and deer, six for desert bighorn, and more than 100 for quail and doves.

The guzzlers collect rainwater for storage in underground tanks which feed to a drinking basin. A float valve keeps the basin full, but prevents waste from overflowing. The basin, often a steel ammunition case is small, about 6 x 10 inches, to keep evaporation at a minimum. With water available, these arid regions become a useable habitat for birds and the larger beasts. Both summer and winter range of the big animals are expanded by many acres. To an extent this makes up for the territory they have lost to man.

Most of the guzzler program combines the efforts of the Bureau of Land Management and the Nevada Fish and Game Department, a cooperative agreement with F&G buying the materials and BLM providing the manpower and equipment to erect them. Three were erected in the Spring Mountain Range for the bighorn sheep at sites which the Fraternity of the Desert Bighorn helped to locate. When Frank Bingham and Marion Escobar of the BLM went out to check on the last one going in, I went along for a look.

First they drove out to Little Red Rock to make sure the float valve on the one there was functioning. It was. This guzzler, like the other two, has two 750-gallon storage tanks. To get it off to a good start—there is no telling when the next rain will come—1,000 gallons of water was brought in by a BLM pumper firetruck.

"The first one in Red Rock Recreation Land was located in Brownstone Canyon," Frank said. "The lower part of the canyon is heavily used now. A lot of people go there. The sheep have been pushed back from the old water hole. The guzzler is higher up the mountain." (There is a small reservoir in Brownstone, the work of the C.C.C. boys in the 1930s. They built a concrete dam that retains water throughout the year.)

The road into Little Red Rock requires 4-wheel-drive. Much of the way is in a wash, and Marion said, "After the first good rain there won't be a road. That's as it should be to keep people at a distance."

The good thing about guzzlers is that they are practically maintenance free. They last indenfinitely and work like perpetual motion. Even from a light sprinkle they can collect a couple of week's supply of water.

Frank drove back on Smoke Ranch Road to Tonopah and headed north to the third site where work was in progress. It is across the valley from Tule Springs, as high up on the Spring Mountain Range as it was possible to force equipment, a backhoe, the tank truck, and pickups.

We found Bill Cavanaugh, Barney Couldon, and Denise Meredith on their lunch break, sitting in the shade under the steel aprons.

"Didn't you save us a sandwich?" Marion asked.

Barney said "We started eating fast as soon as we saw your dust."

Denise is a striking new addition to the regional BLM staff. A graduate of Cornell University, she is the wildlife specialist. I know they will approve. Slender and attractive, Denise acts and dresses like she belonged in the desert, although it has been her home only since June. She is a New Yorker.

I asked if any sheep tracks had been seen here. Denise said "No, but this is on the edge of their winter range. The water will make this a year-long habitat.

"Each of the three guzzlers will service, open for summer usage, 2,600 acres," she said.

Water, of course, is only one factor in the survival ring, which has factors not yet fully understood. Denise mentioned stress, the tension caused by the frequent presence of man and his machines. And since both sheep and man are day animals, the stress factor is compounded.

The guzzlers, by extending the usable range into areas only infrequently used by the off-roaders and the picnickers, may give a strong new lease on life to our diminishing bighorns.

In addition to the three mentioned, BLM and F&G have erected a big game guzzler in the Highland Range out of Searchlight, where F&G earlier had placed one on their own and also built a water development dam in a wash. Ron Lee, F&G regional game assistant under John Donaldson, said, "There is no question but that water is crucial."

At least some proof of this is found at the guzzler set up on the other side of Spring Mountain Range at Wheeler Wells, a summer range for mule deer and the county's only elk herd which, despite its name, was without a water hole. Built in the late 1960s, they used it from the beginning. Now, according to Charles Crunden, "use by elk has been extremely heavy with some animals even bedding down within the livestock enclosure." The elk and deer jump the 4-foot fence which keeps cows out.

The Wheeler Wells guzzler was one of the first co-operative projects of F&G and BLM. This State-Federal cooperation is the way it should be," said John Donaldson. "We hope to continue it. We also are working together in range management to rehabilitate key winter deer range. The first was done at Horsethief Spring out of Ursine in Lincoln County."

In this process, smothering stands of juniper and pinion are taken out, sometimes with fire, so that browse plants, forbs, and grass can be reestablished. We have learned that in some places and under certain conditions, fire has a beneficial effect.

The elk guzzler has a 1,000 square-foot collecting surface and five 600-gallon storage tanks. The sheep guzzlers are smaller—310 square feet of roof and two 750-gallon fiberglass tanks. The top of the apron is painted brown in these new ones so they won't reflect light and draw people. The old ones could be seen for miles.

Denise estimated the annual rainfall at this one to be about 7 inches. Frank figures the roof would thus catch 1,650 gallons a year. Plenty to keep the little basin full at all times.

Incidentally, the sheep fountains are located in open country, away from trees, tall brush, and big rocks. Apparently they like a clear view, an open field where no predator can hide and surprise them.

That afternoon, Marion and I went to Mt. Potosi to check out a big ponderosa, a magnificent specimen for this neck of the woods, growing at a rather low altitude in juniper-pinion country. It is above the Boy Scout camp. I had been there but once, and that five years ago with Mr. and Mrs. George Potter and Maryellen Sandovich as guides. George who has lived here for many years and has tramped the Spring Mountains on foot, claims it is the biggest pine in Clark County. We measured the circumference at 18 feet.

I wasn't sure we could find it. We made one wrong hike over a ridge then located it on the second try, higher up than I remembered. Marion studied it for a while, then he said "It must be 120 feet tall."

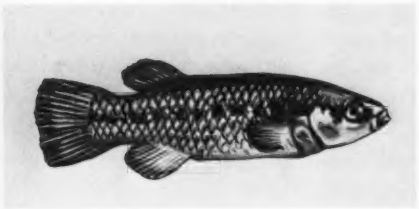
There are three or four ponderosa nearby, an isolated pocket. High above on the nearly sheer rock cliffs grow others, but none come close to matching this monarch. A good 80 feet from the ground is a ragged crown of huge limbs. The top and one of the big limbs have been shattered and killed by lightning.

The late afternoon sun gave us a fine backlight for a photo, but the tree is in a brushy ravine that blocks from view the first 10 or 15 feet of the trunk.

Much higher up on the mountain is a spring which the bighorn frequented. George said that when he was a young fellow, he would sit quietly by the spring and hit two rocks together, and the sheep, overcome by curiosity, would come down to find out what was making the clicking noise. □

Dikes, canals use artesian well water to create several large ponds, support 400 to 500 ducks, 20 to 30 Canada geese

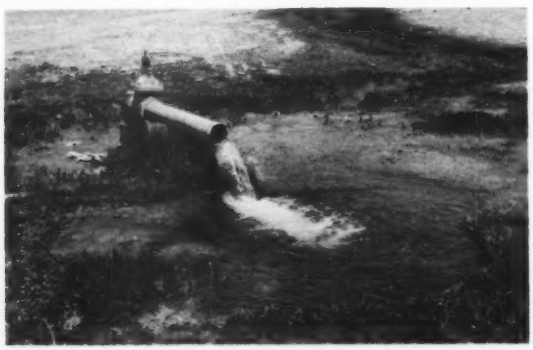
Rare springfish found only in Railroad Valley warm springs



Railroad Valley Has No Railroad

A mix of oil, waterfowl, and rare fish

Artesian wells bring water from deep beneath earth surface to supply waterfowl refuge in arid central Nevada



By ED FISK

Wildlife Management Specialist
BLM District Office
Battle Mountain, Nevada

RAILROAD VALLEY, located in central Nevada, has some unique features:

1. 212 acres of prime waterfowl habitat.
2. The site of the only producing oil field in Nevada.
3. Home for a very rare fish.

The one thing it doesn't have is a railroad.

More rare in the arid, desert-like environment of central Nevada is the waterfowl hunting area.

The Railroad Valley Wildlife Management Area is probably the least known waterfowl hunting area in Nevada. It receives little use because of its location, which is approximately 90 miles east of Tonopah and 70 miles west of Ely, with lots of open space in between.

This waterfowl area was established in 1934 when President Theodore Roosevelt signed an Executive Order withdrawing 133,397 acres of public land to establish the Railroad Valley Waterfowl Refuge.

The U.S. Department of the Interior's Fish and Wildlife Service, given management responsibilities, took advantage of several artesian wells to create ponds and marshes. The Service also dug additional wells in an attempt to flood the dry lake bed in the valley. These efforts failed because the volume of artesian water produced fell far short of the amount needed to create a lake.

In 1952 the waterfowl area was turned over to the Nevada Department of Fish and Game. Additional ponds were created by constructing several dikes. This expanded the waterfowl habitat that had been developed by the Fish and Wildlife Service.

The refuge was reduced to 14,748 acres in 1968, and it is now being managed by the Bureau of Land Management's Battle Mountain District and the Nevada Deprtment of Fish and Game under a cooperative wildlife habitat plan developed in 1973. It is now possible to see 400 to 500 ducks and 20 to 30 Canada geese on these ponds during the spring and fall migration.

Another of the valley's unique features is the Eagle Springs oil field, the only producing oil field in Nevada. This field was discovered by an oil company in 1954, and now contains six producing wells with a production capacity of approximately 250 barrels a day. More than 2½ million barrels of oil have been produced from the field. Most of the oil is being used as fuel for a copper smelter at McGill.

The temperature of the oil coming from the well is about 200° F., and it's easily extracted from the well. However, the oil becomes solid or semi-solid at any temperature lower than 74° F. Once it is removed, special trucks with steam to keep the oil hot must be used to transport it during the colder months.

Railroad Valley has still another claim to fame as the home of rare Railroad Valley Springfish. The springfish were discovered in 1930 in a warm spring in Duckwater Valley (just north of Railroad Valley). At that time, there were populations of Railroad Valley Springfish in most of the warm water springs (80° F. to 96° F.) in Railroad and Duckwater Valleys.

The present population of the Railroad Valley Springfish is not known, but the fish is classified "rare" by the Nevada Department of Fish and Game because of the reduced number of springs where it can still be found. The area remains the only known habitat in the world for this species.

However, the name "Railroad" Valley is not exactly a total misnomer. The area was surveyed for a railroad in 1871. For one reason or another, the railroad was never built, but some optimistic railroad man attached a name that stuck.

Thus these National Resource Lands with an inappropriate name provide a natural resource mix of oil, waterfowl, and rare fish, a typical example of balanced use management on the public domain. □

NEWS HIGHLIGHTS

(Continued from Page 3)

Stringent safeguards to assure that the public's wishes are heeded, and that the environment is preserved and protected, is required under the National Environmental Policy Act of 1969 (NEPA).

These safeguards dictate the path which must be followed before a decision can be made to lease Federally owned oil gas reserves on the OCS.

(*One of the environmental protection measures is described in an article beginning on page 12, "20 Fathoms Deep."*)

Based upon a published, provisional 5-year leasing schedule, the Department of the Interior's Bureau of Land Management takes sequential steps which meet NEPA requirements. The petroleum industry and the public are requested to specify where they believe leases could be offered and to comment on the various environmental implications of such a sale.

A study is made of the resulting proposed area, and a Draft Environmental Impact Statement (EIS) is published upon which public hearings are held. Then a Final EIS is published which takes into account public testimony from the hearings. The entire matter is reviewed by the President's Council on Environmental Quality before the Secretary of the Interior is empowered to determine if a lease sale shall be held.

Thus the balance of public attitudes, petroleum energy needs, and environmental protection is worked out.

Antiquities Desecration Featured on TV

Television watchers are seeing a series of public service announcements produced by the Bureau of Land Management about the desecration of Indian antiquity sites on the National Resource Lands.

The film announcement depicts a family who visits a site for recreation, but litters the valuable record of the past in their quest for recreation.

The problem of protecting such sites is also discussed in this issue of OUR PUBLIC LANDS in a story reprinted from the Christian Science Monitor by permission. The article is titled "How Can American Protect Its Vast Indian Treasureland?" It begins on page 20.

The contribution which the National Resource Lands have made to understanding the past is also seen in an article beginning on page 15, "The War of the Great Bones."

1930 Civilian Conservation Corps left record of terrace rock work near Pony Express station ruins

Those Historic Trails

An end and a beginning

THE PASSING OF the Pony Express, the Overland Mail, and later the famous Lincoln Highway all marked the end of an era of western history. All are represented on National Resource Lands in western Utah, and parts have been perpetuated in the Salt Lake District of the U.S. Department of the Interior's Bureau of Land Management.

In 1976 BLM focal attention and bicentennial efforts will be devoted to the Pony Express-Overland Mail Service as well as to the Dominguez-Escalante and Oregon Trail. Planning efforts for these trails call for uniformly developed interpretive facilities and brochures as well as uniform trailmaking and improvements.

By RICHARD E. FIKE
Archeologist, BLM State Office
Salt Lake City, Utah

The discovery of gold in California together with the migration of thousands of settlers into the West saw the need for faster mail service from the East. Sailing ships took months, mule and stage teams weeks. But three notable freighters on the Pacific coast, Alexander Majors, William Russell, and William Waddell, declared that a pony rider service could make the trip in 8 to 10 days.

From this thinking the Pony Express was born, and on April 3, 1860, the first riders were dispatched from St. Joseph, Mo., and Sacramento, Calif. This service not only sped mail between the East and the West in 8 days but provided communication with Washington in 9 days, a noticeable difference from 3 months.

The route was made up of 190 stations, 420 horses, and 80 riders. At 15 to 20 miles per horse and 75 to 125 miles per rider, the mail could be moved 250 miles in 24 hours. This was efficient and fast moving service,

(Continued on Page 11)

Pony Express Stop Becomes Campsite

SIMPSON SPRINGS, Tooele County—"We chased horses and herded sheep here in the early '20's," said Alma Nielsen, Vernon, Tooele County, nearly 90.

Nielson was one of the 60 or 70 sweltering folk who drove out to this desolate place, 60 land miles southwest of Tooele. Once a stop on the famed Pony Express and Overland Stage route, it was being dedicated as a new Bureau of Land Management campground.

"Looks just the same—few more roads, more trees, more people . . ." Nielsen laughed.

We were all sitting around in the shade of a medium-large juniper tree on metal folding chairs, kids in BLM work clothes, whittling; families with small children; old codgers; a few Army Reserve officers in khaki. A Marine color guard stood in the sun, bearing rifles and huge U.S. and Marine flags.

The brown, flat desert stretched below, dry and barren, all the way to a sharp mountain range on the horizon.

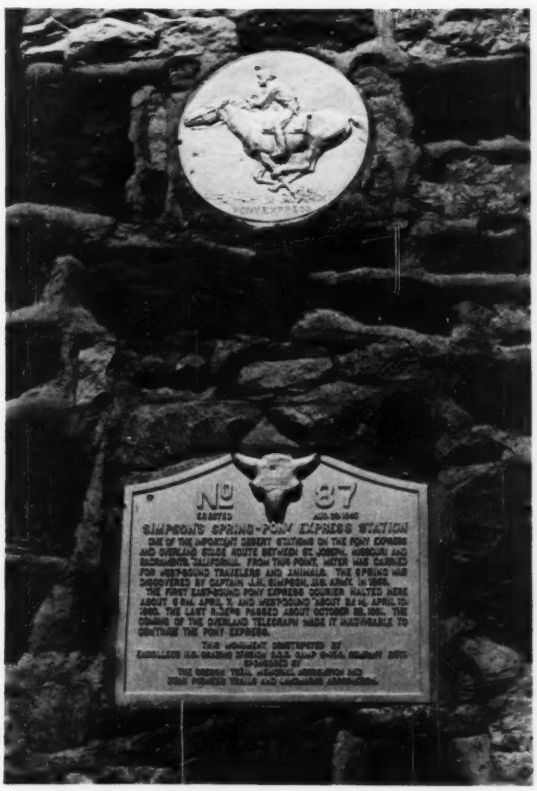
"See the horse coming?" someone asked a little blond boy in a red cowboy hat, up in the juniper tree. On the long, thin gravel road you could see a tiny horse, with a couple of trucks passing it and thick puffs of alkali dust billowing up behind. You could faintly hear the hooves.

A minute later, the horseman was pounding up the hill toward the group, swerving so he wouldn't get too close to the unphotogenic Army helicopter, and he bent down and flung his mailpouch, laughing, to a man who was yelling, "Hello, Kent!"

Thus was the new 10-acre campground dedicated with speeches and relays of modern Pony Express riders who had galloped across the last 17 miles of desert from the Lookout Pass Pony Express Station, carrying a travel-stained proclamation from Gov. Calvin L. Rampton in the mailpouch.

There are 14 campsites, with picnic tables, fireplaces, clean running water, and not much shade. There is also a two-seater outhouse, and gravel paths lined with chunks of rock.

Dr. Dale Berge, a Brigham Young University archeologist who recently dug around the foundation of an ancient store at the Pony Express Station, was there for the ceremony. What did he find?



By JOSEPH BAUMAN

Reprinted with permission from the Deseret News, Salt Lake City, Utah.

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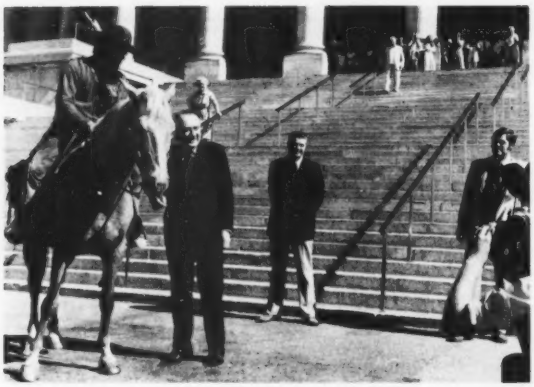


Rider Weldon C. (Bud) Pierson gets letter from Utah Gov. Rampton. From left at rear: BLM State Director Paul Howard, District Manager Gerald C. Hillier. Utah State Capitol steps in background

"Bits and pieces of things—bottles, nails, plate glass, horseshoes. Little by little we're piecing together the history of this area," he said.

"We're going to have a whole new perspective. This seemed to be an unexciting place—so barren and desolate out here—I think now we're going to be able to understand quite a bit more. It was more important than we've realized before."

Berge said excavators came across telegraph insulators dating from 1865. This was a poignant find, because it was the coming of the telegraph in October 1861 that put the Pony Express out of business after 18 months of existence.

The Pony Express was able to get mail from St. Joseph, Mo., to Sacramento, Calif., in a little less than 8 days. The average was about 10 days.

The crumbling walls of the store, which was there in those hair raising times, are now surrounded by a chain link fence.

Dewey H. Olsen, formerly of Vernon and now a Salt Lake City resident, was telling Berge about the years when he and his brother ran the store, from the fall of 1918 until 1926.

The Olsens had another building on the site, and used the old store as a granary. "All the sheepherders and freighters bought from us," he said. "We were their supply station." They sold food for the men and grain for the horses."

Halfway through the ceremony someone realized that the Marines hadn't been turned off; they were still standing at attention in the sun with their flags and guns. So they were told to post their colors, and they marched off through a small parking lot full of cars and campers, and disappeared. □

GOVERNOR'S RAMPTON'S PROCLAMATION

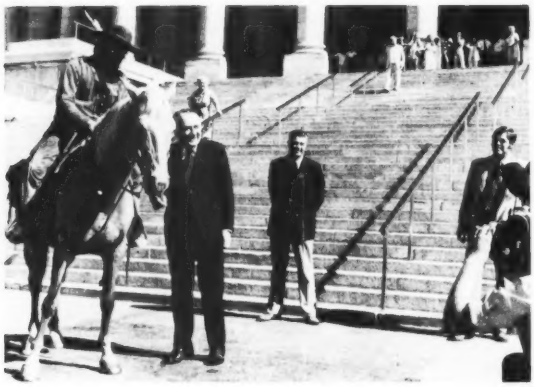
GREETINGS:

I wish to take this opportunity to express my congratulations to the Bureau of Land Management upon their opening another recreation area in the great State of Utah.

Campgrounds such as the new one at Simpson Springs make it possible for Americans from all walks of life to enjoy the out-of-doors. As people come to this campground, they will be able to visualize the hardships that were encountered by those gallant people who helped tame and develop the West.

Utah has had a deep involvement in the history of America. In fact, this State could well be referred to as the State that joined the East and West. There was the driving of the golden spike at Promontory Point which signified completion of the first transcontinental railroad. At Simpson Springs, eastbound Pony Express riders from Sacramento met the westbound riders from St. Joseph, Mo. Then, after just a few months of existence, the Pony Express ceased operations because in nearby Salt Lake City the transcontinental telegraph lines were spliced. Simpson Springs continued its role as a weigh-station, however, because it was on the route of the Overland Stage. Later, the Nation's first transcontinental highway—the Lincoln Highway—generally followed this part of the Pony Express and Overland Stage route. I am pleased, therefore, that the Pony Express Trail, including the Simpson Springs campground, will be one of the focal points in the 1976 U.S. Bicentennial Celebration.

I am sure Utah will continue to be an important part of this Nation's progress, because agencies such as the Bureau of Land Management are working hard to preserve our natural and historical environment. At the same time, these agencies will hopefully continue to take steps necessary, such as developing campgrounds, to develop our resources to meet the needs of this and future generations.



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THOSE HISTORIC TRAILS

(Continued from Page 8)

but it brought about costs greater than income and financial problems plagued the Pony Express from its inception. This financial burden together with the completion of the telegraph in 1861 brought an end to the Pony Express; it had lasted only 16 months. (See "The Pony Express Rides Again," OUR PUBLIC LANDS, Fall 1965.)

In Utah's western desert, the Pony Express and Overland Mail shared much of the same route and facilities. The Overland Mail Service continued in this area until 1870, shortly after the completion of the transcontinental railroad, when it moved north of the Great Salt Lake adjacent to the railroad.

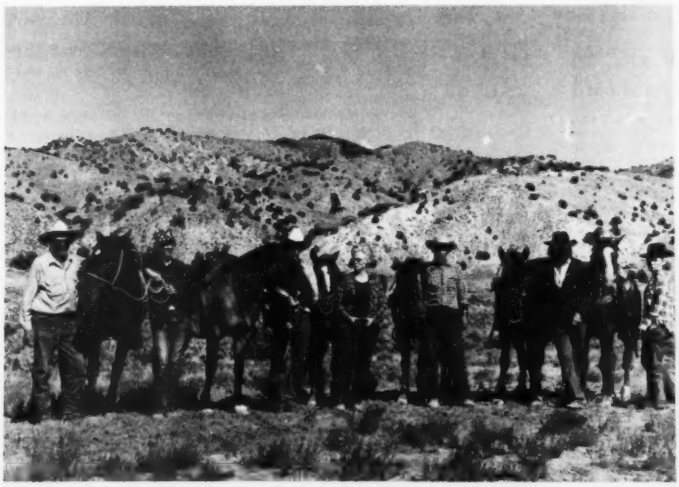
Intermittent activity continued in the area until well into the 1920's, with various freighting and stage services. The famous Lincoln Highway also passes through the area using portions of the old stage route.

As mute testimony to their existence, the ruins of the old Pony Express and Overland Trail stations litter the west desert area and National Resource Lands, occurring approximately every 8 miles. The buildings were built of logs, adobe, and rods.

Present research has located most of the structure locations, and efforts are underway to excavate and stabilize many. Three of the most significant structural complexes were excavated and stabilized in the spring of 1974 by Brigham Young University archeology students under the direction of Dr. Dale Berge of BYU and the author.

The Simpson Springs Pony Express and Overland Mail Station was named for J. H. Simpson, a surveyor sent by Brigham Young to find a better route to the Carson Valley. Simpson Springs was a major stop because of the availability of water. The rock foundation of the original structure and its additions were located through excavation. Through this and other techniques, it was possible to determine how the structure looked.

This year the restoration of the structure was undertaken through the efforts of the Utah State Board of Education, the Bicentennial Commission, and the Future Farmers of America from Tooele, Utah. Additional stabilization methods were applied to both Boyd and Canyon Station. The original canyon station was built 2 miles west at the mouth of Blood Canyon. It was here that Indians killed five people, then burned and pillaged. This site, now called Burn't or Burnout Station, contains little evidence to its location. Being vulnerable to attack, this location was abandoned in favor of the knoll to the east that looks down into Overland Canyon. There a round, rock, defensive structure was built with gun portals which remains there today, several feet high. Through excavation, the station house actually was found within the present parking lot. □



They re-enacted the Pony Express run to Simpson Springs Campground before dedication ceremonies

Melvin Smith, Director of Utah State Historical Society, was speaker at dedication

20 FATHOMS DEEP

MAFLA: new concept in environmental studies

OFF THE FLORIDA GULF COAST—9 a.m., 90 miles from shore, and nine scientist divers aboard the research vessel *Bellows* begin their day's work. In teams of three, the scientists dive to the ocean floor off the west coast of Florida to explore life forms that are important to the survival of the aquatic food chain.

These divers, led by Dr. Thomas Hopkins of the University of West Florida, are working on an unusual research project for the U.S. Department of the Interior's Bureau of Land Management, the Federal agency responsible for leasing oil and gas tracts on the Outer Continental Shelf (OCS). A total of 65 OCS tracts in 5 separate areas are the subject plots for the study. These tracts stretch along the coast of the Gulf of Mexico from Mississippi to the west-central coast of Florida.

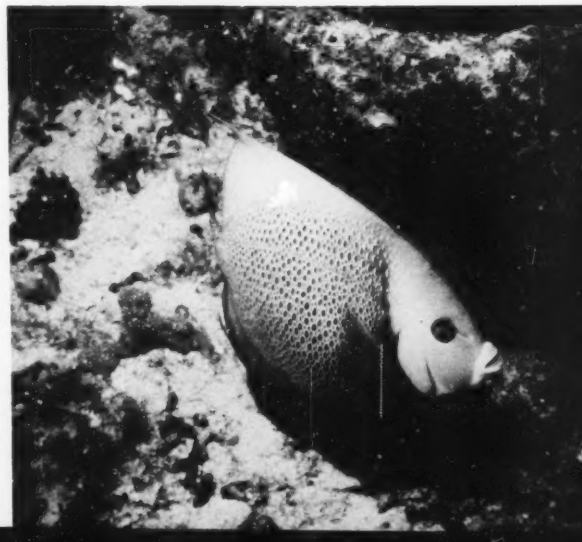
The basic question is: What's there now?—now, before the exploratory drillers move into the area—now, before the giant rigs penetrate the ocean's floor—now, before any potential oil spill can damage the marine environment.

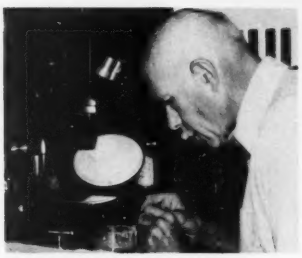
Never before has a submerged lands oil and gas lease undergone such intensive study to determine the

(Right, top)—Typical view of lush growth o
organisms on reef face

(Right, bottom)—Plate-like hard corals, sponges, and branching
(soft corals) provide food and shelter on reef to

(Below)—Camera-loving angelfish swims around territory marked by "loggerhead" sponge in background at 90 feet





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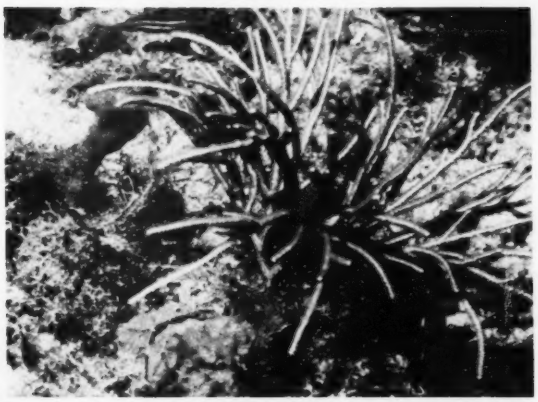
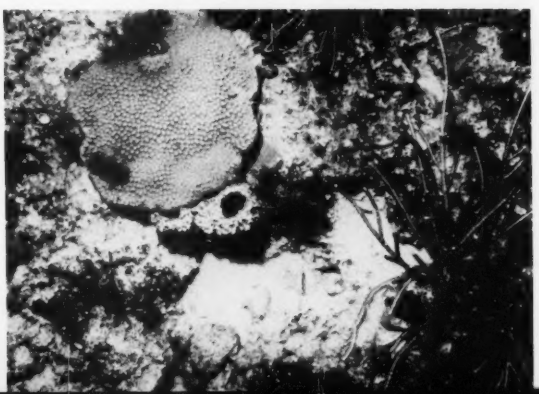
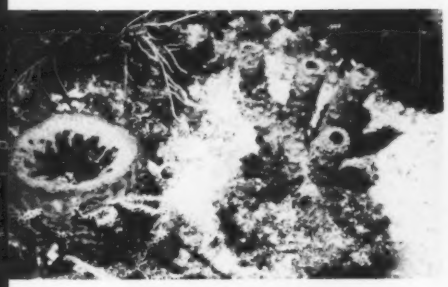




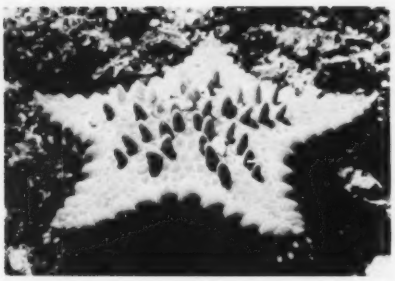
environmental base in advance of drilling operations. Some of the areas support ecosystems so abundant that nearly every inch teems with life covering the entire spectrum of size, color, and sophistication. Because these are fragile areas, they will be ready barometers to measure changes brought by oil operations. Other areas show such a paucity of life that their before-drilling conditions must be logged against future blame to oil producers.

This area has an acronym: MAFLA. MAFLA covers the submerged lands off the coast of Mississippi, Alabama, and Florida. The MAFLA baseline survey has been ordered so that there will exist a measurement of all the valuable natural resources it contains: such obvious food resources for humans as fish, oysters, and

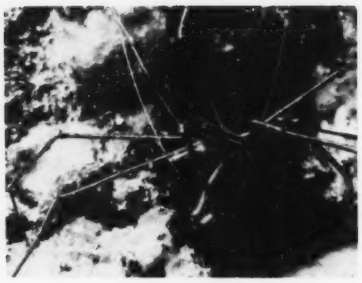
By WILLIAM C. TARPENNING
Public Information Specialist
BLM, Washington, D.C.



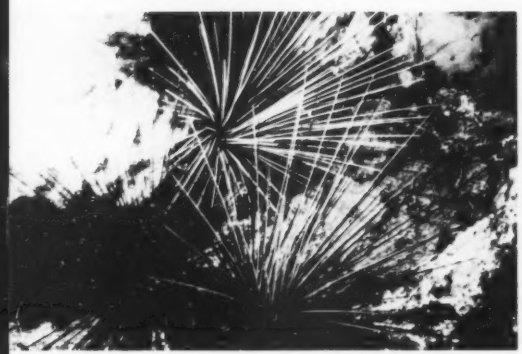
Close up of two major sponge species. Sponges are key animals in monitoring portion of this study



Close up of sea-star, **Goniaster,** at 130 feet, inhabitant of shell rubble areas north and south of reef ridges

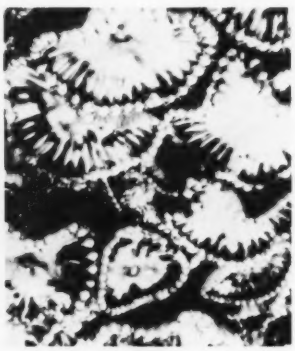


Like a Granddaddy Longlegs spider, this spider crab makes its way across reef face moving from sponge to coral, always being careful to keep safe harbor in reach



Long, delicate-spined sea urchins are indicative of tropical fauna which dot the reef face at 90 feet

Close up of sponge colony. These filter feeding colonies will be used as biological monitors of community change



Like delicate flowers, upturned faces of colonial sea anemone form delicate showcase of animal architecture

shrimp as well as the mineral deposits man must have to sustain a way of life.

From the phytoplankton that float on the ocean's surface to the microscopic foraminifera that live on the ocean floor and in the sand and mud beneath it, all life is analyzed. A multiple discipline team is at work on the task.

Some researchers seek the hydrocarbon count, others measure the level of trace minerals. Noted biologists such as Dr. Henry Ketzler of Florida State University are concerned with species identification and determination of the biomass, or in simple language an estimate of the total mass of living organisms in a sample from a given area.

Dr. Normal Blake, a histopathologist from the University of Southern Florida, is concerned with the current health of living tissue found in the study.

Also participating in the MAFLA baseline environmental survey are the State University of Florida's Institute of Oceanography, University of Miami, University of Alabama, University of West Florida, the Gulf South Research Institute, Louisiana State University, Texas A. & M. University, Gulf Coast Research Laboratories, University of Michigan, and the University of Rhode Island.

The goal of these people and the institutions they represent, and the objective of the MAFLA baseline survey is the preservation of the marine environment.

As other frontier OCS areas are considered for oil and gas leasing, similar surveys will be contracted. Such a survey already is underway in the Arctic waters off the coast of Alaska under the auspices of the National Oceanic and Atmospheric Administration (NOAA), an agency of the U.S. Department of Commerce.

This preexploration procedure is only a beginning, but it is exemplary of a determination by BLM in its role as the Federal agency responsible for OCS lease sales to assure that man in his quest for essential oil and gas does not disturb the balanced equation that is the sea. □

Marsh (center rear) with field party
—Courtesy of the Peabody Museum of Natural History
Yale University

The War of The Great Bones

IT WAS THE YEAR 1869. The United States of America was only 93 years old and was recovering from a disruptive civil war. Maps showed its boundaries as stretching from sea to sea. Its flag showed 37 stars to represent the States in the Union, but there was nothing to show for the 11 territories still awaiting statehood. Geographers had labeled the great heartland of the Nation, roughly covered by the territories, as the Great American Desert.

Citizens of the young Nation still talked about the 7-year-old Homestead Law that would allow any citizen, who had the guts to live on the public lands and convert the virgin soil into farmland, to acquire 160 acres of public domain for his very own. In Kansas, Nebraska, and the Dakotas some patents to homestead land had already been issued. But the Nation still had a vast empire of public domain.

There were few people then who did not know that the vacant and unappropriated lands of the West contained great wealth. At a time when the average income was no more than a dollar per day, the gold fields of California had produced almost $100 million per year. In Nevada gold miners suddenly realized that the ore they were discarding in their search for gold was a high-grade silver ore. This became known as the Comstock Lode, and in 1869 the best of this lode was yet to come. There was also gold in Montana and Colorado, and miners were digging hopefully besides the tracks of covered wagons that had traveled through Wyoming's South Pass along the Oregon Trail.

But these lands held another kind of treasure. Ten years earlier, Charles Darwin had published his "Origin of Species," and the minds of men still reeled under the impact. The debates that Darwin had inspired had aroused an intense public interest in the theory of evolution and in those sciences that might either refute or support it. One such science was paleontology, the study of fossils.

Man's interest in fossils dates back to at least 500 B.C., but his study had become sufficiently sophisticated to be called a science only in the past 100 years that had preceeded the time this story begins.

It was at this point of history that two men started to capture national attention. They were Edward Drinker Cope and Othniel Charles Marsh. It would be hard to find two men, so different in character, who were so passionately interested in the same subject: paleontology. Their contrasting natures and their common interest were to make them lifelong enemies, and to drive

By PAUL C. HERNDON
Writer-Editor
BLM, Washington, D.C.

Cope —Bettman Archives photo

each to almost superhuman efforts in finding and interpreting fossils on public lands of the West.

Each of the two was independently wealthy, and spent his funds freely to further his own discoveries. In 1869 Othniel Marsh was 37 years old. He was the nephew and heir of the philanthropist, George Peabody, and through his uncle he had secured funds to establish the Museum of Science at Yale University. He had also been appointed professor of vertebrate paleontology at Yale.

Edwin Cope was 29 at the time. He had been a child prodigy, and had written his first scientific paper when he was 19. As Marsh had his Museum of Science, Cope was connected with the Philadelphia Academy of Natural Science. He also taught at the University of Pennsylvania. He was a fluent writer and a man of great charm.

Of the two, Cope was clearly the nearer genius, but Marsh had a meticulous, plodding doggedness that made him a good match for the more flamboyant Cope. Neither man was overburdened with scruples. Both freely pirated the works of other men, and accepted the credit that should have gone to others. They also stole fossils and credits from each other, and carried on their personal feud through the scientific journals of the time.

Now the theory of evolution held that living organisms undergo processes of change, and that those changes that enable the organism to fit into its environment are perpetuated so that new species eventually arise from old. What was most disturbing in that day was the obvious implication that Man himself had descended from subhuman ancestors. (A popular way of expressing this was "man descended from a monkey.")

By 1869, paleontologists in Europe had found fossil evidence that indicated that Man did indeed have subhuman ancestors, but since it was believed that Man was a relative newcomer to the North American continent, paleontologists here had no hope of making similar discoveries. However, they did believe that they could fill in some of the gaps in the evolutionary history of the lower animals. Such discoveries would do nicely in corroborating the theory of evolution.

Any palentologist who was fortunate enough to discover fossil evidence of one of these "missing links" (another phrase popular at the time) would have his name perpetuated in textbooks, and thus gain the kind of fame and immortality that would appeal to men like Marsh and Cope.

In 1869 the horse was the animal that was probably most closely associated with Man. Since he had no hope of discovering a prehuman ancestor, Marsh was captivated with the idea of tracing the ancestry of the horse. While on a trip to Chicago, he got word that welldiggers had found some strange fossil bones at a place called Antelope Station. Antelope Station was located near the Nebraska-Wyoming line alongside of the Union Pacific Railroad line. Marsh set out to investigate.

After boarding the train, Marsh learned that Antelope Station was not a scheduled stop for the train. He persuaded the conductor to make a stop anyway (threatening to report the lack of cooperation all the way up to the president of the Union Pacific Railroad was one form of persuasion used), and while the engineer impatiently tooted the whistle and other passengers cursed and swore they were going to shoot Marsh if he didn't hurry, he calmly pawed through the dirt from the well. Eventually he returned to the train with his pockets filled with fossil bones.

He returned to Yale and assembled the bones to form the skeleton of a dawn horse—*Equus parvulus*. *Equus parvulus* was about the size of a collie dog. Such a creature was of course vastly different from the horse of the times, and pictures of Marsh standing beside his discovery were circulated in newspapers from coast to coast.

Marsh's discovery of the dawn horse focused the attention of paleontologists on the public lands of the

West. The following year Marsh continued his investigations, this time on the Green River Plateau near the site of Jim Bridger's old trading post in southwest Wyoming. The area was rich in dinosaur fossils.

The dinosaur was a press agent's dream. First off, it belonged to the reptile family—long associated with the fall of Man and guaranteed to hold those who were spellbound by evil in a perpetual state of fascinated horror. Then, too, it was big. A creature that could have peeked at you from over the roof of a two-story house would command a certain amount of respect in any age, but especially at a time when the public counted what was worthy of its attention in terms of biggness. Then last, but not least, many of the dinosaurs were ferocious, a final ingredient necessary to whip up the public fancy. The very name "dinosaur" was translated to mean "terrible lizard."

The dinosaur was also a highly successful life form. It had dominated the earth for 250 million years. By contrast, Man and his immediate ancestors seem to have been around for no more than 3 million years.

In his search for fossils, the paleontologist looks at the landscape, not as it is today, but at the time the animal whose fossil he seeks was alive.

At the time the dinosaurs lived, the North American continent was vastly different than it is today. An arm of the Gulf of Mexico covered most of what is now the high plains east of the Rocky Mountains with a shallow sea. There were no Rocky Mountains then; they would not upthrust for another 100 million years. The climate was subtropical, warmer and wetter than it is today. The shallow sea and the tropical land around it provided a near ideal habitat for the dinosaurs. They were spread across most of the world, but nowhere did they thrive better or were conditions more ideal for the preservation of their bones than it was on what is now the high plains of the American West.

Jim Bridger had known about the big bones that were scattered about his trading post, and he kept some of the most ferocious examples on display on the walls of his trading post to back up the yarns about terrible beasts that roamed the West, tales that he told to travelers who stopped over on their way to Oregon.

Marsh's diggings on the Green River Plateau were highly successful, and at the end of the season his discoveries, crated up in strong wooden boxes, started to arrive at the Yale Museum. There the crated bones aroused the interest of the scientific world.

Cope now decided that he, too, should investigate the West. In 1872 he arrived on the Green River site, only to find that Marsh had also returned and was already actively engaged in excavating the area.

Eventually Cope confronted Marsh over rights to dig in the area. Technically Cope was right; the area was on public land and neither man had exclusive rights to dig in the area. Marsh, however, refused to be bound by a technicality, and he refused to make room for Cope.

Because gold mining along the Sweetwater River was in a period of decline at the time, many miners were out of work, and so both Cope and Marsh had recruited crews from the ranks of unemployed miners. Marsh doubted that his miners would understand the ethics that bound men in the scientific community, so he simplified the issue for them. He told his crew that Cope and his men were claim jumpers.

Since it was customary for miners along the Sweetwater to shoot a claim jumper, that was harsh condemnation and gunfire was exchanged. Fortunately Cope and his men were able to retreat beyond the range of rifle fire, and no one was hurt.

Cope now decided to leave the Green River diggings to Marsh and moved his men over into the Washakie Basin. Any injury to his pride was soon mollified when he found the fossil digging to be highly rewarding. That summer he discovered and named 60 species of dinosaurs heretofore unknown to the scientific world.

Cope had the rare ability of taking what to others seemed to be flimsy bits of evidence and projecting it into detailed descriptions of undiscovered animal species. On the whole his projections had an uncanny way of proving to be correct. On one occasion he identified 21 different species of dinosaurs from their teeth alone. However in 1871 his daring led him into making his greatest scientific blunder.

The details of this story differ according to whom is doing the telling, but basically it hinges around the discovery of the fossilized skeleton of a giant marine reptile. The skeleton was found in Kansas at a place called Butte Creek near the Colorado line.

Some accounts credit Cope with making the discovery, but Marsh tells us that the skeleton was found by an Army surgeon named Dr. T. H. Turner.

At any rate the bones were shipped to the Philadelphia Academy of Science. Cope examined the bones and rushed into print with a paper describing the animal, and also assembled the bones for exhibition.

It was with considerable envy that Marsh read Cope's paper, and he visited the Philadelphia Museum to have a look at the new exhibit. He must have all but choked with glee when he realized that, in mounting the skeleton, Cope had placed the animal's skull on the end of its tail.

He smugly pointed out the error to Cope. Then, ac-

cording to Marsh, Cope flew into a rage and refused to discuss the possibility that he was wrong. Cope was not to be persuaded until another paleontologist pointed out that there was still a piece of the creature's skull adhering to the first joint of what Cope had taken for the tail.

In all their years of acrimony, Cope often had the best of the arguments that arose between the two men, but Marsh could always take comfort in his memories of having bested Cope on the matter of his hind-part-before dinosaur. He never allowed Cope to live it down.

In the fall of 1872, Marsh got word about fossil bones being brought out of the Black Hills in the Dakota Territory. It was then late in the year to start on a new expedition.

In the Black Hills temperatures had been known to drop 50° below zero, and settlers there were in the habit of stringing lines from their back door to their outbuildings so that they would not become lost during the blinding snowstorms that often struck in the territory. Lost men had been known to freeze to death in such intense cold.

But Marsh was more worried over the possibility that Cope would get wind of the new area. Despite the lateness of the season, Marsh set out for the Dakota Territory.

Temperatures had already dropped down to below freezing by the time Marsh got there. The Army was worried about the possibility of a general Indian uprising in the area, and refused to provide him with an escort. The most Marsh would wangle from the commander was permission to travel on to the Red Cloud Indian Agency with the understanding that the Army assumed no responsibility for his safety.

He received additional warnings to get out of the country from officials of the agency. Instead Marsh hired guides from among the Sioux and set out to search for fossils. The Sioux were a highly disgruntled people at that time, and they did not believe for a minute that Marsh was really interested in bones.

Instead they were convinced that he was looking for gold, and they had decided among themselves that they would string along with him until he found gold. Then, once his deceit had been proven, they intended to kill him and take his arms and supplies.

By the time the party left the Indian agency, the weather was cruelly cold. The crafty Sioux guided him deep into the Black Hills and waited. The guides huddled and shivered about the fire while, much to their surprise and perhaps disgust, Marsh dug fossils from the face of ledges and cutbanks, but ignored the gold-producing streambeds.

The weather got worse, and eventually even Marsh conceded that it was time to return to the agency. Much to the relief of the Indians, he allowed them to escort him back with his mules loaded down with the fossils he had found. Marsh became a legend among the Sioux who gave him the name of Big Bone Chief.

Cope was also to have his triumph among the Indians. That came in 1876 when he visited the Montana Territory to look for fossils in the Bear Paw Mountains. He arrived in Clagget shortly after the battle of the Little Big Horn. The defeat of Custer and his men had convinced many Indians that they were a match for the U.S. Cavalry, and there was an atmosphere of intense excitement among all the tribes.

The whites in the territory expected a general Indian uprising, and tom-toms beat and warriors danced in anticipation of driving the white man from the West.

In the midst of all this, Cope traveled with supreme confidence up the Judith River and made his camp in the midst of Indian encampments. He later estimated that there were a thousand Indians within an hour's ride of his own camp.

It was something like sitting on a powder keg, and his men were frightened. They pleaded with him to leave the territory before the Indians decided to slaughter them all just for practice. But Cope was undaunted and unperturbed. To prove to his men there was no danger, he carried gifts to the chief of the Crows.

There can be no greater tribute to the charm of the man than the fact that by the time he returned to his own camp, Cope and the chief were staunch friends. However, his own men refused to be assured, so the next day Cope carried gifts to the chief of the Blackfeet. No tribe in the West had shown more intense hostility toward the white man than the Blackfeet, but Cope made friends with their chief as easily as he had with the chief of the Crows.

It seems that Cope's charm worked for everyone except his own men. Despite all his arguments, a good portion of his crew deserted him and fled from the area. With the few that remained loyal, Cope set about digging for fossils.

The Bear Paw Mountains were a rich fossil area, and in places Cope's men were able to turn up bones by the shovel. But these bones were so badly fragmented that only the teeth were whole. It was here that Cope identified the 21 dinosaurs from their teeth alone.

Both men were now famous, and their contributions to the field of paleontology had won worldwide recognition. But their rivalry and the animosity between them continued unabated. Competition in the field was augmented by charges and countercharges detailed through the scientific journals, and by political maneuvering in Washington.

The men, their great reptiles, and their feuds made excellent newspaper copy. Through the stories written about them, the public was made aware of the science of paleontology. They literally made "dinosaur" a household word. But neither man can be dismissed as a character or as a clown; each was in his own way a scientific giant.

Marsh had accurately described the *Pterodactyl*—a flying reptile and an evolutionary link between reptiles and birds—with nothing more than a single bone to work from. He was the first to conclude that certain herbivorous dinosaurs may have had a second brain near the base of their tail. In turn, Cope flooded the journals with descriptions of species that were unknown to the scientific world.

Each man was an inspiration to those who worked with him, and they trained their workers well. Many a humble cowboy or unemployed miner caught the bone fever, and many became as expert as either Cope or Marsh in recognizing good fossil diggings.

Cope died in 1897. He was 57 years old. Marsh died in 1899 at 67. One is tempted to wonder what might have been the story if they had chosen to work together. It might have been better, but this is doubtful. These were combative men who thrived on the excitement of controversy. In a way they needed each other, and each was driven to greater achievement out of his need to outdo the other.

In turning to the American West, they focused the attention of the scientific world on an area of tremendous potential. Since their time, much of the public land has passed out of Federal ownership, but what remains continues to yield fossils and artifacts of value to students of both paleontology and anthropology.

In 1968, the Bureau of Land Management established the Cleveland-Lloyd visitor center near Price, Utah, to give the public the opportunity to visit and better understand an area that has proven rich in the yield of fossils. (See "Graveyard of Prehistoric Monsters," OUR PUBLIC LANDS, Winter 1969).

Then early in 1974, Secretary of the Interior Rogers C. B. Morton approved three important fossil sites in Colorado and Wyoming for inclusion in the National Registry of Natural Landmarks. He also approved boundary enlargements of two other Wyoming fossil localities placed in the Registry in 1966.

The natural landmarks program, administered by the Department of Interior's National Park Service, was introduced in 1964. The addition of these 3 new fossil sites brings to 273 the number of nationally significant natural landmarks placed on the Registry.

The three new sites are:

Marsh —Library of Congress photo

Garden Park Fossil Area, Fremont County, Colo., a 160-acre site administered by BLM, with Morrison Formation outcroppings which have yielded fossils of 15 species of dinosaurs, as well as fish, crocodiles, turtles, and mammals; 9 of the fossil species were identified for the first time.

Morrison Fossil Area, Jefferson County, Colo., was the first major site from which giant dinosaur bones were recovered in the late 1800's. Nine species of dinosaur have been recovered; seven of these were new species.

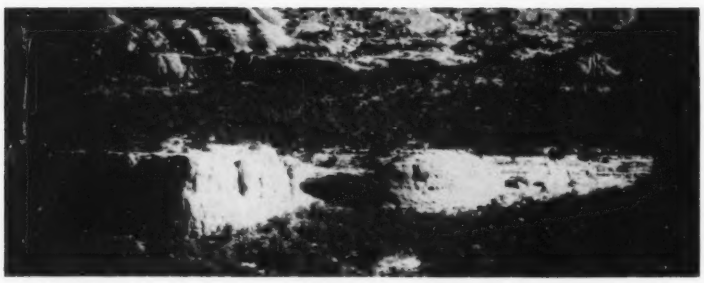
Bone Cabin Fossil Area, Albany County, Wyo., 640 acres of eroded badlands exposing Morrison Formation layers which have yielded significant quantities of Jurassic mammals.

The two areas slated for enlargement on the National Registry are:

Lance Creek Fossil Area, Niobrara County, Wyo., which Secretary Morton has recommended be enlarged from 8 townships to 15½ townships to include the most fossil-bearing strata in this area which produced the first horned dinosaurs as well as the first Cretaceous mammals of North America.

Como Bluff, Carbon, and Albany Counties, Wyo., which originally contained 1,000 acres will be enlarged to 3,680 acres. Nearly all of the restorations of Jurassic dinosaurs were made from bones found at this site, including mounted skeletons in the American Museum of Natural History in New York and the U.S. National Museum of Natural History in Washington, D.C., and the Peabody Museum of Natural History at Yale University. □

How Can America Protect Its Vast Indian Treasureland?



The vast ruins of the southwest Colorado plains are still sacred to the descendants of the Indians who built them—but not to vandals or the destroying sands. The Bureau of Land Management, in charge of this multiple-use area, is fighting to save these ancient sites for scientific investigation. To fail would be to further deplete the heritage of an intensely proud people.

WHAT IS THE Bureau of Land Management doing to protect the Indian archeological treasure in its vast domain? Talks with an anthropologist who has worked on Indian sites in Colorado for the past 10 summers, and a tour with the area manager of 400,000 acres of public land indicate that the BLM is well aware of its riches and is doing what it can to protect them—but would like to do more.

"The southwest corner of Colorado is one of the richest and most extensive areas of Indian sites in the country," says University of Colorado Anthropologist David Breternitz, who with a crew of students and Navaho laborers, has cataloged such sites, excavating and studying them, and stabilizing ancient walls.

"There are more than 6,000 recorded ruins in Montezuma County, which includes Cortez and Mesa Verde. Some are on government, some on private, and some on Indian land. Sites which are taken over by the National Park Service have better protection [than BLM land], but, at the same time, become more public and accessible."

Nonreplaceable resources

In his opinion "the BLM is continually improving its management of public lands, and the public is becoming more and more aware of these nonreplaceable resources."

By JOSEPHINE ROBERTSON

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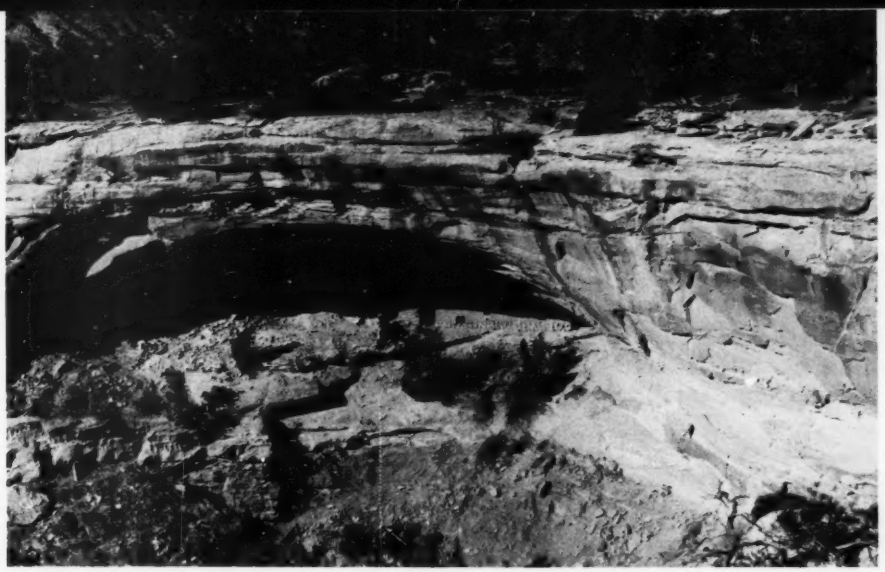

It is significant that in July of this year, an archeologist was added to the state staff. Sharply increasing pressure for oil and gas leases has forced the BLM to rule that prospectors from oil companies or engineering firms must be accompanied by an archeologist to prevent disturbance of sketetal remains or important antiquities.

"What I would like to see is protection, rather than overdevelopment, for the important ruin sites, because these will become increasingly important a hundred years from now. I'd like to see many areas put in 'safe deposit' for future study," says Dr. Breternitz.

This opinion is shared by Jerry D. Kendrick, the tall, soft-spoken manager of the San Juan Resource Area. Since BLM land is "land of multiple uses," Mr. Kendrick has multiple responsibilities, including watershed, forestry, habitat, wildlife and grazing, and minerals management, firefighting, industrial development, and archeology.

Rugged domain

During our many hours of riding in a pickup truck across his rugged domain, Mr. Kendrick showed me little-known Indian sites and ruins, but first we visited the most extensive one which has been partially restored and opened to the public.

Lowry Pueblo Ruins is located 9 miles west of U.S. Route 160 at Pleasant View. This impressive settlement, dating back a thousand years, was once inhabited by the Anasazi, "the ancient ones."

Perhaps a hundred Indians lived here, moving away, returning, and rebuilding, from time to time, creating smaller ceremonial chambers in the main structure and, nearby, an elaborate great kiva (a usually round ceremonial structure, partially buried). This one is among the largest ever found.

The inhabitants apparently lived in peace—there is no trace of fortification—tilling the land for beans, squash, and corn, and hunting what game was available until they left forever shortly before the great drought of 1276–99.

The ruins, buried in dirt, were first excavated in 1934 by Dr. Paul S. Martin of the Chicago Field Museum, who found several layers of kivas and rooms, while beneath these were the remains of primitive pit houses. When he had finished his studies he backfilled the excavations to prevent disintegration and again they were hidden under a curtain of blown silt.

However, 10 years ago BLM sponsored partial restoration and stabilization through a contract with the University of Colorado. In 1967 the Lowry Pueblo was dedicated as a National Historic Landmark. A total of $30,000 has been allocated for further work on the pueblo this fall.

The ancient walls stand on a little rise, with a view across miles of open country. Lowry, however, is unique in the San Juan area. The other ruins stand, as they have for centuries, on the rims of canyons.

A few are protected with high-steel fencing, topped with barbed wire, but there is not enough funding to fence them all. Among those protected are two ancient stone towers in McClean Basin, a deep canyon. No one is sure whether these were watchtowers for guarding against attack on nearby dwellings or whether they were built for religious ceremonial purposes. Today

they stand silent and remote, partly crumbling—with a visitors' register showing no more than two dozen signatures for the past year.

Another enclosure is the pueblo on Cannon Ball Mesa, built at the head of a rocky canyon with signs of a spring at the foot of the cliff.

"The walls are beginning to crumble," Mr. Kendrick observed regretfully as we wandered over the Cannon Ball site. "You can see here how they built a double wall, working smooth the outside surfaces of the stone blocks and filling the middle with dirt. I believe these very dry old branches are part of the original juniper used in roofing the kiva.

"You wonder how they could raise enough food during the short growing season on the mesas to survive the winter," he reflected as we jolted over the stony ground to another site. "Too bad they left no written records!"

At one point I asked if we were really on a road. He assured me we were; "One track means a trail, but two make a road!"

Mr. Kendrick estimated there are more than 40 free-standing ruins in his area and more than a thousand smaller sites. We saw some of them as we returned along a dirt road planted with pinto beans on both sides as far as eye could see. Like islands, every once in awhile, a rough mound would break the furrowed surface.

"Those are all ruins," Mr. Kendrick commented. "Ruins were a nuisance to the old homesteaders. You can't plow through stone walls, so they just worked around them."

One of the BLM's major difficulties in protecting these areas is that pothunters have vandalized many ruin sites. And, with the skyrocketing value of Indian relics, this is an ever-growing problem. The Antiquities Act of 1906 forbids anyone but authorized institutions from disturbing prehistoric ruins on Government land, with heavy penalties for removing artifacts. But this ruling is hard to enforce in isolated, unpoliced areas. Even if apprehended, pothunters are liable to claim that their finds came from private lands not subject to any regulation.

"It's hard to know where public land ends and private land begins," Mr. Kendrick explained. "Most farmers can't afford to fence their fields—and neither can the BLM. More signs are needed and we could use two men for full-time patrol. When the pothunters come we don't have the manpower to protect the sites. Our best protection is keeping roads to a minimum."

Unfortunately, with increasing pressure for mineral exploration, roads are bound to follow.

But the Bureau gets a boost from landowners such as George Kelly, who is keenly interested in protecting Indian antiquities. Mr. Kelly and his wife, well-known in horticulture circles around Denver, "retired" a few years ago to a tract of 100 acres they had purchased in McElmo Canyon, west of Cortez. Here they built a home, planted roses, perennials, and apples, and pursued their many hobbies. To their amazement they discovered that their property contained not only small cliff dwellings, but at least two kivas and many ceremonial items.

Mr. Kelly, fast becoming an expert in Indian lore, has excavated and restored one of the kivas in the ancient style complete to building a ladder that would have suited the Anasazi.

In 1972 the BLM proposed withdrawal of about 5,000 acres of Sand Canyon, near the Kelly property, to protect many Indian sites, including some cliff dwellings under a sweeping sandstone arch at the head of the wild and desolate canyon.

Withdrawal as an "archeological site" under the Recreation and Public Purpose Act of 1954, means closure to mining claims. Access would be primarily by trails, and hopefully someday scientists will learn much here.

Windswept ruin

Not just anyone can excavate on public lands. Scientific groups from universities or other institutions must apply for permission to the U.S. Department of the Interior.

Standing beside a windswept ruin at the head of an isolated canyon, Jerry Kendrick put his hand on a crumbling wall and commented, "What I wish is that we could preserve these sites until qualified people can study them and learn their history."

The homes, kivas, petroglyphs, tools, and pots form a record. C. W. Luscher, acting State director of the State of Colorado's Bureau of Land Management, notes that "once an object is removed from these sites, the record is damaged and incomplete . . . just as if a page were torn from a history book."

To help in the fight against vandalism and to educate the public, the BLM recently has sponsored some TV ads, dramatizing the thoughtless impropriety of taking souvenirs from places sacred to the Indians and their ancestors.

Conservation, in our time, has become a matter of public conscience, but it does not go unchallenged with the drive for access to underground resources. One hopes that widespread concern and interest will extend to strengthening the arm of the BLM with its awesome responsibilities and its men in the field. □

This is a compilation of the most up-to-date information possible on up-coming sales of public lands by State Offices of the Bureau of Land Management. For details of land descriptions, prices, and other information pertinent to sales, you must write the individual State Office concerned. In most cases, there are adjoining landowners who have statutory preference rights and may wish to exercise them to buy the land. Sales notices will point out, insofar as possible, problems relating to (1) access, (2) adjoining owner preference rights, (3) small-tract sales limitation of one per customer, and other pertinent information. When possible, all sales are scheduled far enough in advance so ample notice can be given in Our Public Lands. Sales listed can be canceled on short notice for administrative and technical reasons. A listing of BLM State Offices with addresses is found on this page.

Adjoining landowners have first rights in purchasing public land advertised for sale, and in many cases will prefer to exercise this right.

CALIFORNIA

10 acres, identified as S–3850, 2 miles northeast of Groveland, adjoining Pine Mountain Lake Subdivision in Tuolumne County, Calif. Suitable for subdivision. Surrounded by privately owned land. No public road access. Appraised $14,000.

OREGON

2.24 acres, identified as OR 11160, located approximately 7 miles south of Corvallis in Benton County. Tract has been used for wheat production. Surface is undulating, subject to flooding. Legal access provided by county road along east boundary of tract. Appraised at $1,340. Sale on Mar. 4, 1975.

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555 Cordova St.
Anchorage, Alaska
99501
District Manager
P.O. Box 1150
Fairbanks, Alaska
99701

ARIZONA:
Federal Bldg.,
Room 3022
Phoenix, Ariz. 85025

CALIFORNIA:
2800 Cottage Way,
Room E–2841
Sacramento, Calif.
95825

COLORADO:
1600 Broadway
Room 700
Denver, Colo. 80202

IDAHO:
Federal Bldg.,
Room 334
550 W. Fort St.
Boise, Idaho 83702

MONTANA (N. Dak.,
S. Dak.):
Federal Bldg.
316 North 26th St.
Billings, Mont. 59101

NEVADA:
Federal Bldg.,
300 Booth St.
Reno, Nev. 89502

NEW MEXICO (Okla.):
Federal Bldg.
P.O. Box 1449
Sante Fe, N. Mex.
87501

OREGON (Washington):
729 Northeast
Oregon St.
P.O. Box 2965
Portland, Oreg. 97208

UTAH:
Federal Bldg.
125 South State St.
P.O. Box 11505
Salt Lake City, Utah
84111

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Kans.):
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P.O. Box 1828
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ALL OTHER STATES:
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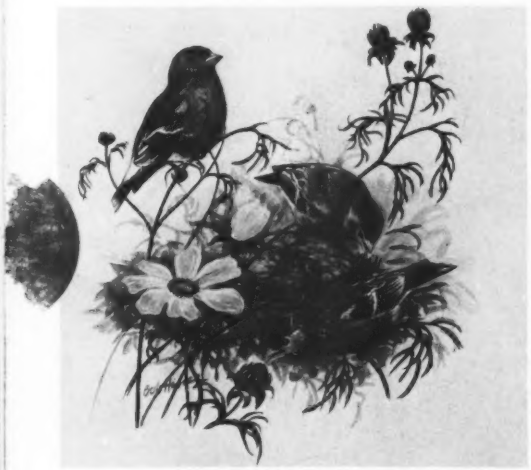

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